



**PATENT**  
**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**  
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Appl. No. : 10/731,600

Appellants: COSTELLO et al.

Filed : December 9, 2003

Title : LOW SEDIMENT FRICTION MODIFIERS

TC/A.U. : 1714

Examiner : Goloboy, J. C.

Docket No.: 0209-PA (UNI249US)

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Commissioner of Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**APPELLANTS' APPEAL BRIEF**

Sir:

The above-identified Appellants submit this Appellants' Appeal Brief pursuant to 37 C.F.R. § 41.37. The Notice of Appeal was filed on August 31, 2007.

Please charge the official fee of \$510 for filing a brief in support of an appeal to the Appellants' Deposit Account Number 23-2656. A duplicate copy of this page is enclosed.

The Appellants rely upon the following authorities and arguments to maintain the appeal.

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**1. Real Party in Interest**

The real party in interest for this matter is the Appellants' assignee. The assignee and real party in interest are Chemtura Corporation, formerly known as Crompton Corporation, Benson Road, Middlebury, Connecticut 06749.

**2. Related Appeals and Interferences**

There are no other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**3. Status of Claims**

Claims 12 through 18 are pending in the application and are subject to a "final" rejection. The rejection of these claims is appealed.

The procedural history behind this status of the claims is as follows.

Application No. 10/731,600 was filed on December 9, 2003. Claims 1 through 20 were originally filed.

An Office Action of August 10, 2006, presented the following rejections:

- (1) Claim 16 was rejected under 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which application regards as the invention;
- (2) Claims 1, 2, 8, 12, and 15 were rejected under 35 U.S.C. § 102(b) as being anticipated by Papay et al. (U.S. Pat. No. 5,652,201);
- (3) Claims 1, 2, 6, and 12 were rejected under 35 U.S.C. § 102(b) as being anticipated by Denis (U.S. Pat. No. 4,954,273);

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(4) Claims 1, 2, 5, and 12 were rejected under 35 U.S.C. § 102(b) as being anticipated by Watts (U.S. Pat. No. 5,885,943);

(5) Claims 3, 4, 13, and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. (U.S. Pat. No. 4,995,993);

(6) Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Ramey (U.S. Pub. No. 2004/0063589);

(7) Claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Chladek (U.S. Pat. No. 3,754,684);

(8) Claims 9 and 16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Hartley (U.S. Pub. No. 2004/0180798);

(9) Claim 20 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Chladek as applied to claim 19 above, and further in view of Hartley et al.; and

(10) Claims 10, 11, 17, and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Calhoun (U.S. Pat. No. 3,198,737).

The Appellants filed a Response of December 11, 2006, and amended claims 1 through 4, 9, 12 through 14, 16, 19, and 20 and added new claim 21.

An Office Action of March 2, 2007, made final the following rejections:

(1) Claims 1 through 21 were rejected under 35 U.S.C. § 112 as failing to comply with the written description requirement;

(2) Claims 1 through 11 and 19 and 20 were rejected under 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellants regards as the invention;

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(3) Claims 1 through 4, 8, and 12 through 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. (U.S. Pat. No. 4,995,993);

(4) Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. and further in view of Watts;

(5) Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. and further in view of Denis;

(6) Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. and further in view of Ramey (U.S. Pub. No. 2004/0063589);

(7) Claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. and further in view of Chladek (U.S. Pat. No. 3,754,684);

(7) Claims 9, 16, and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. and further in view of Hartley (U.S. Pub. No. 2004/0180798);

(8) Claim 20 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. and Chladek and further in view of Hartley et al.;

(9) Claims 10, 11, 17, and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. further in view of Calhoun (U.S. Pat. No. 3,198,737);

(10) Claims 1 through 4, 8, and 12 through 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al.;

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(11) Claim 5 rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. further in view of Watts;

(12) Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. further in view of Denis;

(13) Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view Papke et al. further in view of Ramey (U.S. Pub. No. 2004/0063589);

(14) Claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. further in view Chladek (U.S. Pat. No. 3,754,684);

(15) Claims 9, 16, and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. further in view of Hartley et al. (U.S. Pub. No. 2004/0180798);

(16) Claim 20 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. and Chladek further in view of Hartley et al.; and

(17) Claims 10, 11, 17, and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. further in view of Calhoun (U.S. Pat. No. 3,198,737).

The Appellants filed an amendment of 37 C.F.R. § 1.116 of July 31, 2007, and canceled claims 1 through 11 and 19 through 21.

An Advisory Action of August 14, 2007, maintained the rejection of claims 12 through 18 under 35 U.S.C. § 112 and 35 U.S.C. § 103 as being unpatentable over Papay et al. in view of Papke et al. The Examiner entered the amendment of July 31, 2007, for purposes of appeal.

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A Notice of Appeal was filed on August 31, 2007, for the rejection of claims 12 through 18.

**4. Status of Amendments**

The Examiner entered the Amendment Under 37 C.F.R. § 1.116 for purposes of appeal. The pending claims for appeal are claims 12 through 18. The attached listing of claims reflects the claims proposed after the final Office Action of March 2, 2007.

**5. Summary of Claimed Subject Matter**

Pending claims 12 through 18 include a single independent claim 12. Claim 12 recites a lubricant composition. The lubricant composition is an additive mixture to provide a low sediment characteristic for lubricant oils.

Claim 12 recites a lubricant composition, which includes a “lubricant oil stock,” as disclosed in the specification from page 1 at line 19 through page 2 at line 3; page 3 at lines 17 through 21; page 4 at lines 9 through 13; page 5 at lines 12 through 15; page 7 at lines 15 through 21; and page 10 at line 9. An amorphous overbased alkaline earth metal sulfonate is added in a concentration sufficient to provide the lubricant oil a sedimentation rate of no more than about 0.005 percent per week at 70°C for at least 12 weeks. The composition also includes at least one friction modifier which is selected from a specific group. (See the claimed invention on specification from page 1 at line 19 through page 2 at line 3; page 3 at lines 17 through 21; page 4 at lines 9 through 13; page 5 at lines 12 through 15; page 7 at lines 15 through 21; and page 10 at line 9.)

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Claim 13 recites a desirable embodiment of the lubricant composition wherein the amorphous overbased calcium sulfonate has a particle of no more than about 30 nm. The desirability of an amorphous overbased calcium sulfonate having this particle size is described on page 3 at line 17 to page 4 at line 2.

Claim 14 recites a desirable embodiment of the lubricant composition wherein the amorphous overbased calcium sulfonate has a total base number of at least about 400. The desirability of an amorphous overbased calcium sulfonate having such a total base number is described on page 3 at lines 7 through 16.

Claims 15 through 18 recite desirable embodiments of the lubricant composition wherein the friction modifier is a specific reaction product. The desirability of the specific friction modifiers is described on page 5 at lines 12 through 15.

The desirability of the claimed embodiments is also supported by the examples in the application.

**6. Grounds of Rejection to Be Reviewed on Appeal**

The grounds of rejection to be reviewed on appeal include the rejections of claims 12 through 18 as applied by the Examiner under 35 U.S.C. §§ 112 and 103. The Examiner further explains these two rejections in the Advisory Action of August 14, 2007.

The rejection based on 35 U.S.C. § 112, first paragraph, objects to claims 12 through 18 as containing subject matter not described in the specification. Specifically, the Examiner states that there is no support (1) for the phrase “a sedimentation rate of no more than about 0.005% per week at 70°C for at least 12 weeks” or (2) for reduced sedimentation in a

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composition containing amorphous overbased calcium sulfonate in a concentration other than 10 percent.

The rejection under 35 U.S.C. § 103 objects to claims 12 through 18 for the reasons set forth in paragraphs 15, 20, and 22 of the final Office Action of March 2, 2007. Specifically, the Examiner states that claims 12 through 15 are unpatentable over Papay et al. in view of Papke et al., that claim 16 is unpatentable over Papay et al. in view of Papke et al. and further in view of Hartley et al., and that claims 17 and 18 are unpatentable over Papay et al. in view of Papke et al. and further in view of Calhoun.

**7. Argument**

The Appellants incorporate by reference the statements in support of patentability made in their two responses during the prosecution of the application. Their argument on appeal is otherwise as follows.

**The Background of the Invention**

The invention is a low sediment additive mixture for lubricant oils which comprises an overbased alkaline earth metal sulfonate with a selected friction modifier. The Appellants discovered that amorphous overbased calcium sulfonate is superior to crystalline calcium overbased sulfonate in terms of undesired sedimentation. The Appellants' claimed lubricant composition provides very low sedimentation percentages which are typically about 0.001 to about 0.005 percent.

The unexpected result of very low sedimentation of the Appellants' claimed invention is non-obvious over the prior art. Stocks of lubricant oils containing friction modifiers and detergent additives during storage, especially in warm temperatures, experience significant

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sedimentation. In a typical storage tank containing many thousands of gallons of lubricant oil, a sedimentation rate of a few percent can correspond to a thousand or more gallons of bottom sediment.

The non-obvious aspect of claim 12 is the combination of an amorphous overbased alkaline earth metal sulfonate in an amount sufficient to provide a sedimentation rate of no more than about 0.005 percent per week at 70°C for at least 12 weeks in combination with one or more specific, claimed friction modifiers. Even less obvious to one or ordinary skill in the art are the desirable embodiments presented in claims 13 and 14 for specific amorphous overbased calcium sulfonates, and in claims 15 through 18 for specific friction modifiers. Each of these claims presents a patentably distinct recitation over the cited art.

The prior art fails to disclose or suggest that the combination of an amorphous overbased alkaline earth metal sulfonate in an appropriate concentration with one or more specific friction modifiers reduces sedimentation in lubricant oils. The specific sulfonates and friction modifiers may be known in the prior art, but the prior art fails to teach the importance of the combination, regarding sediment reduction, or of using an appropriate combination of these elements. The prior art does not disclose or suggest that this claimed combination in the appropriate concentration will produce the unexpected results of very low sedimentation in stored lubricating oil.

### **The Pending Rejections**

The Examiner presents rejections under 35 U.S.C. §§ 112 and 103. Each of these rejections has multiple facets. The Appellants request reversal of the Examiner's rejections for the following bases.

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**1. Rejection under 35 U.S.C. § 112, First Paragraph**

The Examiner states that there is “no evidence in the application as originally filed for a sedimentation percentage below about 0.001%.” The specification on page 10 at line 9 identifies the percentages for “very low sedimentation” as provided by the invention as being “typically about 0.001 to about 0.005.” The higher percentage, as presented in claim 12, is directly supported by the specification, contrary to the Examiner’s statement. This rejection should be reversed.

The Examiner also states that there is no “evidence of any reduced sedimentation for a composition containing amorphous overbased calcium sulfonate in a concentration other than 10%.” The 10 percent concentration is the preferred concentration for the specifically identified commercial sulfonate. However, the application identifies a range of “about 0.001 to about 0.005” percent of sedimentation. This disclosure is an indication that variations in the sulfonate, such as its particle size or concentration, will produce greater or lesser results on a specific lubricating oil. Obtaining a desired percentage of sedimentation by altering particle size or concentration of an amorphous overbased alkaline earth metal sulfonate is well within the skill of the art. This rejection should be reversed.

**2. Rejection under 35 U.S.C. § 103**

**a. Claims 12 through 15**

Claims 12 through 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. This combination of art fails to disclose the non-obvious features of these claims and fails to disclose their unexpected result.

The Examiner acknowledges in paragraph 9 of the Office Action of August 10, 2006, that “Papay does not disclose whether the overbased calcium sulfonate used in the lubricant

composition is crystalline or amorphous, and also does not disclose the particle size of the overbased calcium sulfonate.” However, it is equally important that Papay et al. use their selected overbased alkaline earth metal-containing compounds as “detergents.” Papay et al. combine such a detergent with one or more boron-free additive compositions formed by heating an ashless dispersant with an inorganic phosphorus acid. (See the '201 patent from column 4 at line 64 through column 5 at line 9.) Papay et al. do not disclose the claimed combination or concentration of compounds required to reduce sedimentation. More importantly, Papay et al. teach away from the claimed invention by instructing one of ordinary skill to form an “indispensable additive ingredient” which is a reaction product with the ashless dispersant and an inorganic phosphorus acid. (See the '201 patent in column 13 at lines 42 through 48.)

The Examiner relies upon Papke et al. for their disclosure of particle size ranges for the amorphous overbased alkaline earth metal sulfonate. The Papke et al. disclosure also fails to disclose the claimed combination of compounds or the concentration of compounds required to reduce sedimentation

The Examiner’s cited combination of art fails to make obvious the Appellants’ claimed combination of compounds or the required concentration to achieve the Appellants’ unexpected results. The Examiner relies on art that teaches one away from the actual combination of compounds claimed by the Appellants. This rejection should be reversed.

**b. Claim 16**

Claim 16 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. and further in view of Hartley et al. This combination of art fails to

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disclose the non-obvious features of this claim and fails to disclose its particularly unexpected and desirable result.

The Examiner relies on Hartley et al. for their disclosure of triethanolamine and tall oil fatty acid, containing stearic acid, with oleic acid. Again, the Examiner's cited combination of art fails to make obvious the Appellants' claimed combination of compounds or the required concentration to achieve the Appellants' unexpected results. The Examiner relies on art that teaches one away from the actual combination of compounds claimed by the Appellants. This rejection should be reversed.

**c. Claims 17 and 18**

Claims 17 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Papay et al. in view of Papke et al. and further in view of Calhoun. This combination of art fails to disclose the non-obvious features of this claim and fails to disclose its particularly unexpected and desirable result.

The Examiner relies on Calhoun for its disclosure of a friction modifier comprising a diethylene glycol dioleate, a reaction product of diethylene glycol and methyl oleate, as recited in claim 18. In Example V, the Examiner relies on Calhoun for disclosing a friction modifier comprising a thioglycol (2,2'-thioethanol) dioleate, a reaction product of thioglycol with methyl oleate as recited in claim 17.

The Examiner's cited combination of art fails to make obvious the Appellants' claimed combination of compounds or the required concentration to achieve the Appellants' unexpected results. The Examiner relies on art that teaches one away from the actual combination of compounds claimed by the Appellants. This rejection should be reversed.

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**Conclusion**

The Appellants maintain that this file should be remanded to the Examiner for further prosecution or the rejections should be reversed, and favorable consideration of the application is respectfully requested.

**8. Claims Appendix**

An appendix is attached that contains a copy of the claims, as amended, that are involved in this appeal.

**9. Evidence Appendix**

The Appellants do not rely on additional evidence in this appeal.

**10. Related Proceedings Appendix**

The Appellants are unaware of any related proceedings.

Respectfully submitted,

31 Oct 07  
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**Claims Appendix**

Listing of Claims:

1 - 11. (Canceled)

12. (Previously Presented) A lubricant composition comprising:

a) a lubricant oil stock

b) an amorphous overbased alkaline earth metal sulfonate in an amount sufficient to provide a sedimentation rate of no more than about 0.005% per week at 70°C for at least 12 weeks; and,

c) at least one friction modifier selected from the group consisting of a polyalkylene succinic anhydride, an overbased alkaline earth carboxylate, the reaction product of an alkanoamine with a fatty acid or a fatty ester, the reaction product of thiodiglycol with a fatty acid or a fatty ester and the reaction product of a dialkylene glycol with a fatty acid or a fatty ester.

13. (Previously Presented) The lubricant composition of claim 12 wherein the overbased alkaline earth metal sulfonate is an amorphous overbased calcium sulfonate having a particle size of no more than about 30 nm.

14. (Previously Presented) The lubricant composition of claim 13 wherein the amorphous overbased calcium sulfonate has a TBN of at least about 400.

15. (Original) The lubricant composition of claim 12 wherein the friction modifier comprises the reaction product of triethanolamine with a fatty acid or fatty acid ester.

16. (Previously Presented) The lubricant composition of claim 15 wherein the friction modifier comprises the reaction product of triethanolamine with one or more of a fatty compound selected from the group consisting of methyl oleate, tall oil fatty acid, oleic acid, ricinoleic acid, isostearic acid, erucic acid, mixed oleic acid/stearic acid and iso-oleic acid.

17. (Original) The lubricant composition of claim 12 wherein the friction modifier comprises the reaction product of thioglycol with methyl oleate.

18. (Original) The lubricant composition of claim 12 wherein the friction modifier comprises the reaction product of diethylene glycol with methyl oleate.

19 - 21. (Canceled)

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**Evidence Appendix**

The Appellants do not submit any further evidence pursuant to 37 C.F.R. §§ 1.130, 1.31, or 1.132.

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**Related Proceedings Appendix**

No decisions rendered by a court or the Board in any proceeding identified pursuant to 37 C.F.R. § 41.38(c)(1)(ii) are known to the Appellants.